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AN UNUSUAL OVIPOSITION SUBSTRATE FOR *HESPERIA OTTOE*  
(HESPERIIDAE) IN SOUTHWESTERN MINNESOTA

Published information on the life history of *Hesperia ottoe* Edwards gives fall witchgrass, *Leptoloma cognatum* (Schult.) Chase, as the oviposition substrate and larval host for populations in Michigan (Nielsen 1958, *Lepid. News* 12: 37-40; Nielsen 1960, *J. Lepid. Soc.* 14: 57). I report the use of a different and unusual oviposition substrate in southwestern Minnesota in 1978 and 1979.

Observations were made approximately 2.8 km SW of the town of Lake Benton, Lincoln Co., in a deeply dissected region of a prominent terminal moraine. Prior to its acquisition by The Nature Conservancy in 1978, the site was heavily grazed by domestic livestock. The vegetation on the steeply rolling upland *ottoe* habitat here is dry-mesic native grassland dominated by midgrass species.

*Hesperia ottoe* females oviposited on inflorescences of the pale purple coneflower, *Echinacea pallida* Nutt. (nomenclature according to Gleason & Cronquist 1963, *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*), which were also used by males as perching sites from which mate-locating flights were launched, and by both sexes as their major nectar source. Ova were usually placed among the stiff spiny receptacular bracts which extend beyond the disk flowers they subtend (Fig. 1), though a few eggs were observed near the base of ray flowers. The majority of inflorescences had a single egg, but two were frequently present, and as many as five were occasionally seen.

The purple coneflower is almost certainly not a larval host; all hosts observed at this site were grasses (Poaceae), as are all known hosts for the genus (MacNeill 1975, in Howe (ed.), *The Butterflies of North America*, p. 464). No larval feeding on the coneflower was observed; larvae dropped off the inflorescences into the grasses (usually a few cm below) as soon as they hatched and finished eating the chorion. Females were occasionally observed ovipositing on host grasses (four species), and one oviposition



FIG. 1. Closeup of disk of *Echinacea pallida* inflorescence with two ova of *Hesperia ottoe* (center of photograph), showing typical placement. Ray flowers are visible in the lower part of the photograph. Scale line = 2 mm.

on the leaf of another forb was seen. Though no determination of the relative frequencies of utilization of various substrates was possible, oviposition on the coneflowers appears to be a major behavioral characteristic and not the result of "mistakes" or random choice. About 600 inflorescences with eggs were tagged during desultory inspection in 16 ha of habitat in 1978, and a sampling program in 32 ha in 1979 revealed several times that number with ova on them. Ova were found on coneflowers at two other sites in southwestern Minnesota in 1978 and in several pastures near the study site in 1979. No evidence of oviposition by females on other flowers was found.

This use of a non-host oviposition substrate is reminiscent of the behavior of some populations of *Hesperia lindseyi* Holland reported by MacNeill (1964, Univ. Calif. Publ. Entomol. 35: 1-130) which oviposit on an arboreal lichen. The selective pressures responsible for the behavior in *H. ottoe* are unknown. Domestic livestock avoid grazing the evidently unpalatable coneflower as presumably bison did, and it may be that larvae in the immediate vicinity of these plants are thus less likely to be trampled or eaten by large ungulates. *H. ottoe* is known to occur in the absence of *Echinacea pallida* (e.g., a colony in southeastern Minnesota in a relict sand dune habitat, and Michigan populations), and it may be that the distribution of the behavior will provide a clue to its significance. It is hoped that this note will alert observers elsewhere to look for the behavior.

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#### POLYMORPHISM IN LARVAE OF *CATOCALA BLANDULA* (NOCTUIDAE)

On 25 April 1979 six larvae of *Catocala blandula* Hulst hatched from eggs laid by one female from Lebanon, New Jersey. They were fed on *Crataegus*. When in the